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ORIGINAL ARTICLE

Beyond humor styles: the nature of humor types and differences in basic personality traits from Zuckerman's Alternative Five-Factor Model

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BACKGROUND
Findings show that the complex nature of humor and its personality basis can be more comprehensively understood if humor styles are analyzed simultaneously within humor types, rather than separately.

PARTICIPANTS AND PROCEDURE
Utilizing two independent samples (*N1* = 253, *N2* = 353) of self-report responses to the Humor Styles Questionnaire (HSQ) and the Zuckerman-Kuhlman-Aluja Personality Questionnaire-Short Form, this paper outlines how the HSQ responses result in three humor use types following cluster analysis. Cluster differences in humor styles and personality traits were analyzed using ANOVA.

RESULTS
In both samples, a humor type characteristic of individuals who scored lower in the positive and higher in the negative humor styles was revealed. People within this humor type also scored significantly higher in the personality measures of neuroticism and aggressiveness. A second humor type replicated in the two studies described individuals scoring higher for each of the four humor styles. People within this type also scored significantly higher on extraversion and sensation seeking, suggesting a need for cortical arousal. The third humor type members scored lower in each of the humor styles (apart from the affiliative humor style scores for one of the samples). This humor type requires further investigation.

CONCLUSIONS
In general, humor types provide an additional understanding of humor use as people within the types differ for specific personality dimensions.

KEY WORDS
cluster analysis; humor types; alternative five-factor model of personality

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BACKGROUND

Investigating humor types, as patterns of humor styles, allows better insight into the nature of humor. Studies that analyze clusters of humor styles show some similarities in results, but not all the clusters are replicated (Evans et al., 2020). Certain types of humor emerged consistently, while some are confirmed only within specific contexts (Evans & Steptoe-Warren, 2015). The aim of the current research is to examine whether cluster analysis for humor styles reveals distinct humor types. To provide a more comprehensive explanation of possible differences between humor types, personality traits from the Alternative Five-Factor Model (AFFM; Zuckerman et al., 1993) were examined in conjunction with Martin et al.'s (2003) humor styles. By examining humor style clusters and personality differences between humor types, the present study adds to our understanding of the relationships between humor and personality.

HUMOR STYLES AND HUMOR TYPES

Martin et al.'s (2003) humor style model is based upon everyday use of humor. The underlying dimensions of the humor styles model are the use of humor to enhance oneself vs. to enhance relationships with others, and the use of humor in a positive manner vs. detrimentally, and they form four humor styles: affiliative, self-enhancing, aggressive, and self-defeating.

The affiliative humor style refers to positive humor directed to others and involves telling jokes, witticism, and to facilitate relationships by humor. The self-enhancing humor style refers to a positive humorous outlook on life and includes the predisposition to be amused by incongruities of life and use humor as a coping mechanism.

The aggressive humor style refers to negative humor used to defeat others and entails sarcasm, irony, ridicule and belittling. The self-defeating humor style refers to using negative humor directed to self and includes self-disparaging comments and a tendency to amuse others by joking at one's own expense.

The Humor Styles Questionnaire (HSQ) has been widely used in investigations and has been reported to be an adequate psychometric tool. The scale's structural properties, stable associations with personality traits and well-being (Ruch & Heintz, 2014), as well as cross-cultural applicability of the scale (Schermer et al., 2019) have been confirmed. Although the HSQ is used widely, the examination of humor styles and their relations with psychological variables cannot provide a full insight into the complex nature of humor. Leist and Müller (2013) argue that persons do not use only one humor style, but instead use each humor style with a different frequency. The combination of different humor styles may develop different patterns of relations with other psychological constructs. Galloway (2010) explored the individual differences in combining the four humor styles with k-mean cluster analysis and identified four clusters of distinct humor style patterns, which were compared using personality traits from the Five-Factor Model. Identified cluster findings were: 1) those above average in all four humor styles were also above average in openness and extraversion and below average in consciousness and agreeableness; 2) those below average in all four humor styles were above average in consciousness and below average in extraversion; 3) those above average in positive and below average in negative humor styles were also above average in consciousness, extraversion and agreeableness and below average in neuroticism; 4) those below average in positive and above average in negative humor styles were also below average in openness, extraversion, and agreeableness. Galloway (2010) explained the differences in humor styles and personality traits between clusters by the level of optimal cortical arousal.

Leist and Müller (2013) confirmed three clusters from Galloway's (2010) study but failed to confirm the cluster with low positive and high negative humor styles. Evans and Steptoe-Warren (2015) examined patterns of humor styles based on employees' assessment of their managers' humor styles. Clusters with above average in all humor styles, as well as above average in positive and below average in negative humor styles were replicated. The third cluster included managers with high aggressive humor and low other three humor styles, which the authors described as a pattern with below average use of all humor styles from both Galloway's (2010) and Leist and Müller's (2013) studies. The cross-cultural generalizability of humor style clusters was analyzed by Evans and associates (2020) derived from data from the UK, the Netherlands, and Poland. The cluster with participants below average for all humor styles and the cluster with participants above average for all humor styles were replicated. Humor types were also found to explain a greater proportion of variance, compared to individual humor styles, in assessments of well-being and friendship.

In general, some humor types were replicated across studies, but some humor types, such as high in negative and low in positive humor styles, fail to replicate. These failures to replicate may be because of differences in the social context of the studies (Evans et al., 2020).

Further investigation of humor types is needed to shed additional light on their stability.

THE ALTERNATIVE FIVE-FACTORS MODEL (AFFM) OF PERSONALITY

The AFFM personality traits (neuroticism, extraversion, sensation seeking, aggressiveness, and activ-

ity) were defined based on conditioning and learning processes, and physiological, biochemical, neurological, and genetic bases of personality (Zuckerman et al., 1993). Neuroticism refers to frequent worry tension, fearfulness, sadness, sensitivity and dependence of others. Extraversion refers to cheerfulness, sociability, positive view of life and consideration towards others. Sensation seeking refers to an interest in experiencing new thrills, a willingness to take risks while seeking novel experiences, and a preference of unpredictable situations. Aggressiveness includes a readiness to express aggression, quick temper, toughness and hostile behavior. Activity refers to a tendency to be occupied all the time, a preference for hard work, readiness to accept challenges and an inability to relax.

Zuckerman (1991) argued that basic dimensions of personality must be reliably identified across different methods, samples, and non-human species, be linked with significant biological markers, and must have moderate heritability estimates. According to Zuckerman (2008), the personality traits from the AFFM, in contrast to traits from the Five-Factor Model, meet these criteria and represent a more comprehensive personality model.

HUMOR STYLES AND AFFM OF PERSONALITY

Studies have indicated that there are underlying physiological processes associated with different aspects of humor (Vrticka et al., 2013) and that humor types, based on cluster analyses of humor styles, are linked to optimal cortical arousal (Galloway, 2010). These results support the notion that the AFFM of personality may provide a more comprehensive insight into the nature of humor-related behavior. Hence, the AFFM (Zuckerman et al., 1993), which provides a causal explanation of behavior that includes physiological, biochemical, and neural processes, was chosen for this study.

In the first study investigating the relations between humor styles and the alternative five factors of personality (Čekrlija et al., 2022), sensation seeking had significant positive correlations with each humor style and had the greatest predictive power in predicting humor styles. Both positive humor styles positively correlated with extraversion and negatively with neuroticism. The aggressive humor style correlated positively with sensation seeking and extraversion, but unlike positive/benign humor styles, it also correlated with the personality dimension of aggressiveness. The self-defeating humor style was in the neuroticism space and was assumed to be the only humor style associated with the decrease of being negatively aroused by stimuli. Čekrlija et al. (2022) concluded that humor styles can be explained through their relationship with the AFFM of personality and individual differences in the optimal level of cortical arousal.

THE PRESENT RESEARCH

The overview of the relations between humor styles and AFFM factors indicates that cortical arousal might have an important role in the use of humor. The present study examines humor types, instead of separate humor styles, and the relationship between humor types and the AFFM personality traits. The first aim was to identify distinct humor types and to examine their differences in humor styles. The second was to analyze differences in the AFFM personality traits between identified humor clusters and add to our understanding of the relationship between humor types and optimal cortical arousal.

STUDY 1

This study is a reanalysis of the data from Čekrlija et al. (2022). Cluster analysis was performed with the purpose of identifying patterns of humor styles, to create humor types, and to analyze differences in AFFM personality dimensions between the humor types. It is expected that the identified humor types will correspond to the clusters found in Galloway's (2010) study and that the clusters' differences in AFFM personality scores can be explained based on individual differences in optimal cortical arousal.

PARTICIPANTS AND PROCEDURE

The sample from Čekrlija et al. (2022) included 253 respondents (148 female) from Bosnia and Herzegovina, aged between 20 and 60 years (M = 25.13, SD = 9.36).

Measures

The Humor Styles Questionnaire (HSQ; Martin et al., 2003) includes four scales that assess four humor styles (affiliative, self-enhancing, aggressive, and self-defeating). The questionnaire consists of 32 items (8 items per scale) responded to on a 7-point Likert scale from 1 (*completely disagree*) to 7 (*completely agree*). In these data, scales showed satisfactory reliability: affiliative humor style (.77); self-enhancing humor style (.80); aggressive humor style (.65); self-defeating humor style (.73).

The Zuckerman-Kuhlman-Aluja Personality Questionnaire-Short Form (ZKA-PQ-SF; Aluja et al., 2019) consists of 80 items and includes five scales (16 items per scale). Each scale includes four facets. Participants respond on a 4-point Likert scale from 1 (*completely disagree*) to 4 (*completely agree*) providing measures

of the AFFM traits and facets. Scales and facets, along with Cronbach's α coefficient values, are acceptable and are presented in Table 1, Čekrlija et al. (2022).

Statistical analysis

K-mean cluster analysis was conducted to categorize respondents by their standardized scores on the humor style scales. The number of cluster solutions was examined using the R package MOCCA (Kraus et al., 2011) which compares concurrent clusters solutions regarding four parameters: multiple correspondence analysis index (MCA; Kraus et al., 2011), Jaccard's coefficient (Jaccard, 1908), Fowlkes-Mallow's index (FM; Ben-Hur et al., 2002), and Clustering Quality Score (CQS; Kraus et al., 2011). A more qualitative and robust cluster solution should have the first three coefficients higher and the last one lower than the others. Differences in the AFFM scores across clusters were analyzed using ANOVA.

RESULTS

Descriptive statistics

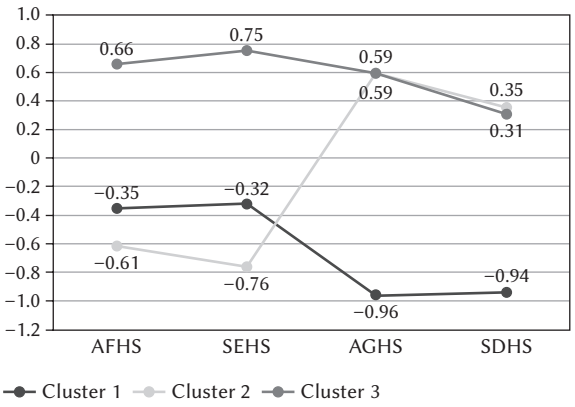
The descriptive values for this study were initially published in Table 1, Čekrlija et al. (2022). Each variable had acceptable skewness and kurtosis values. Men scored significantly higher on the aggressive humor style scale and women scored significantly higher on the neuroticism and sensation seeking personality scales.

Cluster analysis

The analysis of quality and stability of indicators suggested a three-cluster solution (MCA = 67; Jaccard = .70; FM = .74; CQS = .97). Figure 1 presents the cluster centroid values. Cluster 1 includes respondents (n = 66) with lower scores in the affiliative and self-enhancing humor styles and very low scores in the aggressive and self-defeating humor styles. Respondents in Cluster 2 (n = 79) have low scores in the affiliative and self-enhancing humor styles and high scores in the aggressive and self-defeating humor styles. Cluster 3 includes respondents (n = 108) with high scores for all four humor styles.

Figure 1

Mean Z scores for humor styles for each cluster



Note. AFHS – affiliative; SEHS – self-enhancing; AGHS – aggressive; SDHS – self-defeating.

ANOVA

Differences in AFFM traits between clusters were analyzed using ANOVA. Results in Table 1 demonstrate significant differences among humor clusters in all AFFM traits and almost all facets. The greatest differences were identified in relation to extraversion while the smallest differences were for neuroticism. Overall, these effects could be interpreted as medium and large differences (Cohen, 1988). The members of Cluster 1 are characterized by moderately low extraversion, average neuroticism and low aggression, sensation seeking and activity. Cluster 2 members had higher aggression and neuroticism, and low extraversion, sensation seeking and activity. Cluster 3 members had higher extraversion, sensation seeking and activity, and low aggression and neuroticism.

DISCUSSION

The results of the cluster analysis confirmed three humor types, similar to the results reported by Galloway (2010), with the exception that the present study failed to demonstrate a cluster characteristic of average positive/benign humor styles and below average negative humor styles as reported by Galloway (2010). It is assumed that the difference in the number of identified clusters might be primarily attributed to different criteria used for deciding the best cluster solution. While Galloway (2010) used parsimony and interpretability criteria, this study utilized exact numerical criteria.

Clusters 1 and 3 are in accordance with Galloway's (2010) assumptions regarding base arousal as an underlying variable in humor. Members of Cluster 1 (below average on each humor style scale) are more withdrawn, with low aggressiveness, need for excitement, and sensations. These individuals tend not to engage in using humor. Members of Cluster 2 (below average in the positive/benign and above average in the negative humor styles) can be described as self-critical, with a relatively low energy level, and not open to social interactions or new experiences. These individuals use humor to protect their self-image from potential threats. Cluster 3 individuals (above

Table 1

ANOVA, scores by clusters for AFFM traits and facets

	Cluster 1		Cluster 2		Cluster 3		*F*	*p*	Partial η^2
	M	*SD*	*M*	*SD*	*M*	*SD*			
EX	48.71	7.31	45.77	5.77	52.44	5.95	26.25	< .001	.17
NE	35.15	9.14	38.72	9.63	33.80	9.68	6.22	.002	.05
SS	39.07	7.21	40.98	7.02	44.34	7.33	11.90	< .001	.09
AG	32.37	6.75	38.16	7.61	34.06	7.32	12.66	< .001	.09
AC	41.24	7.79	41.05	7.83	44.99	8.07	7.31	.001	.06
EX1	12.66	2.12	11.98	2.00	13.56	2.01	13.92	< .001	.10
EX2	11.39	3.08	9.94	3.02	10.97	2.98	4.55	.011	.04
EX3	11.50	2.73	11.55	2.46	14.00	2.07	33.13	< .001	.21
EX4	13.15	2.13	12.27	2.19	13.90	1.91	14.23	< .001	.10
NE1	8.66	2.75	9.50	2.93	8.51	3.05	2.72	.064	.02
NE2	9.22	2.79	10.36	3.17	8.76	3.03	6.52	.002	.05
NE3	9.34	2.48	10.06	2.77	9.18	2.74	2.47	.086	.02
NE4	7.81	3.12	8.78	3.03	7.33	2.99	5.44	.005	.04
SS1	7.98	3.29	9.00	3.38	9.76	3.37	5.08	.001	.04
SS2	11.84	2.36	11.93	2.61	13.02	2.11	7.22	< .001	.06
SS3	9.65	2.31	10.56	2.29	11.35	2.64	9.91	< .001	.07
SS4	9.59	1.89	9.48	1.99	10.19	2.12	3.35	.036	.03
AG1	6.45	1.87	7.87	2.73	7.25	2.22	6.75	.001	.05
AG2	9.87	2.68	11.18	2.62	10.66	2.64	4.44	.013	.03
AG3	8.06	2.60	9.86	2.79	8.32	2.58	10.49	< .001	.08
AG4	7.98	2.37	9.24	2.27	7.81	2.43	9.06	< .001	.07
AC1	8.86	2.75	8.58	2.92	9.90	3.13	5.18	.006	.04
AC2	10.40	2.97	10.30	2.81	11.60	2.83	5.92	.003	.05
AC3	9.42	2.60	10.24	2.57	10.18	2.57	2.25	.107	.02
AC4	12.54	2.25	11.92	2.36	13.29	2.19	8.50	< .001	.06

Note. AFFM – Alternative Five-Factor Model; AG – aggressiveness; AC – activity; EX – extraversion; NE – neuroticism; SS – sensation seeking; EX1 – positive emotions; EX2 – social warmth; EX3 – exhibitionism; EX4 – sociability; NE1 – anxiety; NE2 – depression; NE3 – dependency; NE4 – low self-esteem; SS1 – thrill and adventure seeking; SS2 – experience seeking; SS3 – disinhibition; SS4 – boredom susceptibility; AG1 – physical aggression; AG2 – verbal aggression; AG3 – anger; AG4 – hostility; AC1 – work compulsion; AC2 – general activity; AC3 – restlessness; AC4 – work energy.

average for all humor styles) are active, outgoing, open to new experiences, and low in neuroticism. In addition, personality traits scores at the Clusters 3 members are similar to the description of histrionic self-presentation style (Fanslau et al., 2021), which uses all kinds of humor in order to draw attention and entertain others, liven up the atmosphere and reduce the tension.

In conclusion, Study 1 confirmed that the examination of humor types enables a more comprehensive insight into the common core of humor style profiles and allows for a more precise understanding of associations with personality and possible neural processes underlying personality traits. The identified clusters of humor found correspond to the findings from Galloway (2010), Leist and Müller (2013), and Evans et al. (2020), supporting the stability of humor types generated from humor styles. In addition, the number of identified humor types is closely linked with the criterion of selection within the cluster analysis. These findings are tested in the second study, conducted on a new sample of participants.

STUDY 2

Study 1 was a reanalysis of data from Čekrlija et al. (2022). Study 2 examines the same variables with a new sample to assess whether the results could be replicated.

PARTICIPANTS AND PROCEDURE

Following the suggestion to have at least 70 participants per potential cluster (Dolnicar et al., 2014), 400 questionnaires were distributed to students from the Department of Psychology within the Faculty of Philosophy at the University of Banja Luka. Participants (N = 353; 211 female), between 18 and 72 years old (M = 25.95, SD = 8.68) returned completed questionnaires. Participation was completely voluntary and anonymous.

Measures

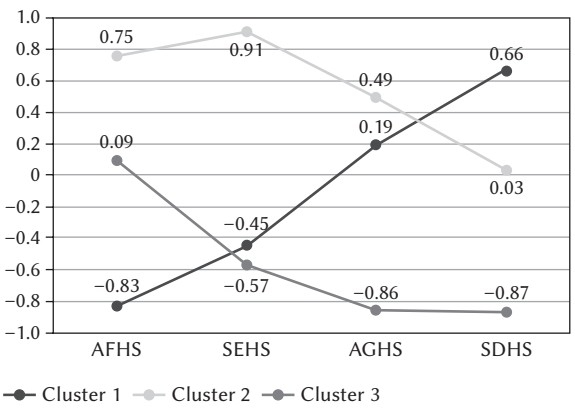
Study 2 employed the same questionnaires used in Study 1, including the HSQ (Martin et al., 2003) and the ZKA-PQ-SF (Aluja et al., 2019). Table 2 lists the reliability and descriptive parameters for the scales and facets.

Statistical analysis

First correlations between the humor styles scores with the AFFM trait and facet scores were calculated. Classification of respondents into typical patterns of humor styles was performed using cluster analysis as in Study 1 and an ANOVA was computed to test the differences between clusters of humor styles for the alternative five personality traits.

Figure 2

Mean Z scores for humor styles for each cluster



Note. AFHS – affiliative; SEHS – self-enhancing; AGHS – aggressive; SDHS – self-defeating.

RESULTS

Descriptive parameters and correlations

Supplementary Table S1 lists the descriptive statistics for the HSQ and ZKA-PQ-SF. The results for both the humor style scales and the personality trait scales are, in general, in accordance with findings from Study 1. The HSQ had satisfactory reliability. Skew indexes for the ZKA-PQ-SF were appropriate for the five scales and all facets, except AG1. Reliability coefficients were satisfactory for all ZKA-PQ-SF scales, while lower values of Cronbach's α coefficients were observed for the facets SS2, SS4, AG3, and AC3. Men scored significantly higher on the aggressive humor style scale and the personality scales of sensation seeking and aggressiveness.

Supplementary Table S2 lists the correlations between the humor style scores and the AFFM traits and facets. The affiliative humor style positively correlated with extraversion and sensation seeking, and negatively with neuroticism and aggressiveness. The self-enhancing humor style positively correlated with extraversion, sensation seeking and activity, and negatively with neuroticism. The aggressive humor style positively correlated with aggressiveness and sensation seeking and negatively with neuroticism. The self-defeating humor style only had a significant positive correlation with neuroticism.

Cluster analysis

Numerical indicators suggested a three-cluster solution (MCA = 78; Jaccard = .86; FM = .86; CQS = .98). The mean Z-scores for humor styles and three clusters are presented in Figure 2. Respondents in Cluster 1 (N = 126) are characterized by low scores for positive humor styles and high scores for negative humor styles, especially the self-defeating style. Cluster 2 (N = 126) includes respondents with high scores for all humor styles except the self-defeating style, which was close to the average. Respondents in Cluster 3 (N = 101) have low scores for all humor styles except the self-affiliative style, which was close to the average.

ANOVA

The ANOVA revealed significant differences between humor clusters for the AFFM traits except activity, with the greatest effect for extraversion and neuroticism (see Table 2). Furthermore, there were significant differences across humor style clusters for all the personality facets, except for the activity factor. Cluster 1 describes members with higher scores for neuroticism, average scores for aggressiveness, and low scores for extraversion and sensation seeking. Cluster 2 includes participants with high scores for extraversion and

Table 2

ANOVA, scores by clusters for AFFM traits and facets

	Cluster 1		Cluster 2		Cluster 3		*F*	*p*	Partial η^2
	M	*SD*	*M*	*SD*	*M*	*SD*			
EX	41.12	7.46	53.14	5.84	45.47	9.28	81.84	< .001	.32
NE	42.27	6.80	32.43	7.81	38.03	10.33	44.57	< .001	.20
SS	37.81	7.77	44.16	7.48	37.35	7.85	29.48	< .001	.14
AG	37.96	7.51	36.30	8.73	33.06	7.28	10.90	< .001	.06
AC	40.58	7.06	40.49	7.46	38.42	8.55	2.75	.066	.02
EX1	10.55	2.27	13.23	2.00	11.36	2.59	45.56	< .001	.21
EX2	9.96	3.01	12.10	2.81	11.67	3.04	18.32	< .001	.10
EX3	10.23	2.63	13.83	2.00	11.18	3.07	65.18	< .001	.27
EX4	10.37	2.67	13.97	2.01	11.24	3.10	65.05	< .001	.27
NE1	10.63	2.22	8.03	2.55	9.62	3.29	29.81	< .001	.15
NE2	10.76	2.31	8.51	2.69	10.49	2.98	26.33	< .001	.13
NE3	10.55	2.13	8.73	2.26	9.19	2.82	19.52	< .001	.10
NE4	10.32	2.35	7.15	2.64	8.72	3.52	39.63	< .001	.19
SS1	8.51	3.27	9.92	3.05	7.83	3.26	12.89	< .001	.07
SS2	9.98	2.33	12.50	2.24	11.72	2.41	38.55	< .001	.18
SS3	9.88	2.34	11.25	2.61	8.77	2.41	28.97	< .001	.14
SS4	9.43	2.26	10.48	2.32	9.02	2.31	12.44	< .001	.07
AG1	8.69	2.74	7.69	2.55	6.52	1.83	22.19	< .001	.11
AG2	10.14	2.45	11.42	2.84	9.78	2.52	12.88	< .001	.07
AG3	9.73	2.37	8.99	2.82	8.90	2.88	3.49	.031	.02
AG4	9.38	2.37	8.25	2.54	7.86	2.60	11.66	< .001	.06
AC1	9.68	2.79	8.25	2.67	8.76	3.32	7.74	.001	.04
AC2	10.17	2.55	10.59	2.86	9.83	3.07	2.09	.126	.01
AC3	9.47	2.26	10.13	2.39	8.07	2.04	23.84	< .001	.12
AC4	11.25	2.32	11.50	2.73	11.75	2.79	1.02	.360	.01

Note. AFFM – Alternative Five-Factor Model; AG – aggressiveness; AC – activity; EX – extraversion; NE – neuroticism; SS – sensation seeking; EX1 – positive emotions; EX2 – social warmth; EX3 – exhibitionism; EX4 – sociability; NE1 – anxiety; NE2 – depression; NE3 – dependency; NE4 – low self-esteem; SS1 – thrill and adventure seeking; SS2 – experience seeking; SS3 – disinhibition; SS4 – boredom susceptibility; AG1 – physical aggression; AG2 – verbal aggression; AG3 – anger; AG4 – hostility; AC1 – work compulsion; AC2 – general activity; AC3 – restlessness; AC4 – work energy.

sensation seeking, low scores for neuroticism, and average scores for aggressiveness and activity. The members of Cluster 3 are characterized by the lowest scores for aggressiveness, activity and sensation seeking, and average scores for extraversion and neuroticism.

DISCUSSION

Study 2 replicated the number of clusters in Study 1. Study 2 also demonstrated that the humor types could be explained based on individual differences in optimal cortical arousal based on the AFFM. Below, we discuss the slight differences between the clusters found in the two studies.

GENERAL DISCUSSION

The two studies here aimed to uncover potential humor types by applying cluster analysis to responses to the four humor style scores from the HSQ (Martin

et al., 2003). Study 1 was a reanalysis of data from Čekrlija et al. (2022) and Study 2 was a new independent sample. Following the establishment of clusters, or humor types, the differences in personality were determined by examining the scales and facets from the AFFM (Zuckerman et al., 1993). Significant differences across the humor types would suggest that the types differ with respect to the levels of cortical arousal.

Cluster results in Study 1 were similar to those in Study 2 with the exception of Study 1's Cluster 1 and Study 2's Cluster 3. For this humor type, Study 1 described the profile as characteristic of low scores on the four humor style scales. The low scores for three of the four humor style scores were replicated in the humor type in Study 2 except for the affiliative humor style score. This cluster requires further investigation to determine whether the results indicate separate humor types or whether the results from Study 2 are slightly anomalous. Interestingly, for both Study 1 and Study 2, the low humor-use type represents either the middle or lowest scoring group for the personality variables.

Study 1's Cluster 2 is very similar to Study 2's Cluster 1 with low positive humor style scores (self-enhancing and affiliative), higher negative humor style scores (aggressive and self-defeating), and higher scores on the AFFM neuroticism and aggressiveness scales. How this humor type is related to other individual difference dimensions is an area requiring future research, as the distinction with the AFFM dimension activity was less clear. Study 1's Cluster 3 was replicated in Study 2's Cluster 2 representing those who score higher on each humor style scale and also score higher on the AFFM dimensions of extraversion and sensation seeking, suggesting that this humor type is most characteristic of those seeking cortical arousal. Such findings are also compatibile to Kfrerer and Schermer (2020) and probably indicate that all four humor styles within this humor type are in the direct function of the regulation of person's base arousal.

The findings support the argument that analyses of humor types, as patterns of humor styles, provide a more comprehensive insight into the nature of humor. Compared with the analysis of individual humor styles (Čekrlija et al., 2022), this study gives more precise information about diverse functions of distinctive humor styles, cortical arousal-based patterns of grouping of humor styles into humor types, and the role of personality traits in humor types. Typological approaches of this sort provide us with confirmation of the double function of humor styles. For example, the aggressive humor style can be beneficial when used with other styles to increase cortical arousal, but also malign when used with self-defeating humor to reduce unpleasant feelings and decrease cortical arousal. In general, it may be concluded that the level of optimal cortical arousal determines a frequency of humor use while styles and types of humor are defined by personality traits. Sensation seeking and extraversion are associated with the tendency to increase arousal by using humor, while aggressiveness and neuroticism, depending on specific humor types, can both reduce and increase cortical arousal. Such an interpretation is compatible with the findings of Moreira et al. (2022), who concluded that overall humor potential is energized by temperament dimensions (novelty seeking, harm avoidance, reward dependence, and persistence), while humor styles are shaped by character traits (self-directedness, cooperativeness, and self-transcendence). Such results encourage further investigation of humor types.

The clusters identified here are considered as separable combinations of humor styles. The stability of the clusters of humor styles may be a potential weakness. Clusters from Galloway's (2010) study can be recognized in our results but cannot be exactly replicated. Possibly there are subtypes within the same cluster of humor styles and these subtypes may be dependent upon context, research design, or sample characteristics. In addition, the criterion for the number of specific clusters may also result in different cluster solutions, which should be kept in mind when comparing clusters from different studies.

LIMITATIONS AND FUTURE RESEARCH

A possible limitation in this research involves the samples. While the sample in Study 1 is relatively small for cluster analysis, samples in both studies have a wide age range of participants. As humor types may be context sensitive, future research on humor types should include different samples and possibly more age-homogeneous samples. In addition, because there are gender differences in both humor style scores and personality, future research may want to examine whether the clusters, or humor types, replicate for men and women separately. A second possible limitation concerns the fact that the present study relied on self-report measures which may have been influenced by response styles. Future research should try to incorporate observational data in the assessment of humor styles and personality traits. Reliance on only four numerical parameters in determining numbers of specific clusters may be considered as a weakness of the study. Simultaneous use of several different criterion parameters in the selection of the number of clusters is recommended for future research investigating humor types.

Another possible limitation was the choice of personality measure. High correlations between some of the humor style scale scores and the personality measures, such as the affiliative humor style and extraversion in Study 2, almost suggest that the affiliative humor style can be equated with extraversion.

Future research is needed to help explain the variance in the affiliative humor style scale that is due to extraversion and its facets versus the amount of variance that is distinctly humor related. For example, do affiliative behaviors yield similarly high correlations with the affiliative humor style scale scores, indicating that humor is not essential, as argued by Ruch and Heintz (2017), or are there varying correlation magnitudes dependent upon the actions? Addressing these questions may help to explain how the affiliative humor style is distinct as opposed to being a facet of extraversion.

In conclusion, as previous research has shown that humor is trainable and that training individuals to use humor may lead to other desirable outcomes (Ruch & McGhee, 2014), different training models may be required for individuals in the different humor types. For example, individuals with high scores on all four humor styles may need to learn how to utilize certain humor styles in specific social contexts. Therefore, humor training programs could be developed in accordance with different humor style clusters, or humor types.

Supplementary materials are available on journal's website.

Disclosure

The authors declare no conflict of interest.

References

Aluja, A., Rossier, J., Oumar, B., García, L. F., Bellaj, T., Ostendorf, F., Ruch, W., Wang, W., Kövi, Z., Ścigała, D., Čekrlija, Đ., Stivers, A. W., Di Blas, L., Valdivia, M., Ben Jemaa, S., Atitsogbe, K. A., Hansenne, M., & Glicksohn, J. (2020). Multicultural validation of the Zuckerman-Kuhlman-Aluja Personality Questionnaire shortened form (ZKA-PQ/SF) across 18 countries. *Assessment, 27*, 728–748. https://doi.org/10.1177/1073191119831770

Ben-Hur, A., Elisseeff, A., & Guyon, I. (2002). A stability-based method for discovering structure in clustered data. *Pacific Symposium on Biocomputing*, 6–17.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Čekrlija, Đ., Mrđa, P., Vujaković, L., & Aluja, A. (2022). Relationship between humor styles and alternative five factors of personality. *Personality and Individual Differences, 194*, 111625. https://doi.org/10.1016/j.paid.2022.111625

Dolnicar, S., Grün, B., Leisch, F., & Schmidt, K. (2014). Required sample sizes for data-driven market segmentation analyses in tourism. *Journal of Travel Research, 53*(3), 296–306. https://doi.org/10.1177/0047287513496475

Evans, T. R., Johannes, N., Winska, J., Glinska-Newes, A., van Stekelenburg, A., Nilsonne, G., Dean, L., Fido, D., Galloway, G., Jones, S., Masson, I., Soares, A., Steptoe-Warren, G., Thompson, N., & D'Angelo Ungson, N. (2020). Exploring the consistency and value of humour style profiles. *Comprehensive Results in Social Psychology, 4*, 1–24. https://doi.org/10.1080/23743603.2020.1756239

Evans, T. R., & Steptoe-Warren, G. (2015). Humor style clusters: Exploring managerial humor. *International Journal of Business Communication, 55*, 443–454. https://doi.org/10.1177/2329488415612478

Fanslau, A., Pawel, J., & Renner, K. H. (2021). The assessment of the histrionic self-presentation style: Initial validation of the Polish version of the As-If-Scale. *Current Issues in Personality Psychology, 9*, 165–178. https://doi.org/10.5114/cipp.2021.105326

Galloway, G. (2010). Individual differences in personal humor styles: Identification of prominent patterns and their associates. *Personality and Individual Differences, 48*, 563–567. https://doi.org/10.1016/j.paid.2009.12.007

Jaccard, P. (1908). Nouvelles researches sur la distribution florale [New research on floral distribution]. *Bulletin de la Société Vaudoise des Sciences Naturelles, 44*, 223–270. https://doi.org/10.5169/seals-268384

Kfrerer, M. L., & Schermer, J. A. (2020). Humor styles and the ten personality dimensions from the Supernumerary Personality Inventory. *Current Issues in Personality Psychology, 8*, 352–360. https://doi.org/10.5114/cipp.2020.101187

Kraus, J. M., Müssel, C., Palm, G., & Kestler, H. A. (2011). Multi-objective selection for collecting cluster alternatives. *Computational Statistics, 26*, 341–353. https://doi.org/10.1007/s00180-011-0244-6

Leist, A. K., & Müller, D. (2013). Humor types show different patterns of self-regulation, self-esteem, and well-being. *Journal of Happiness Studies, 14*, 551–569. https://doi.org/10.1007/s10902-012-9342-6

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being: Development of the Humor Styles Questionnaire. *Journal of Research in Personality, 37*, 48–75. https://doi.org/10.1016/S0092-6566(02)00534-2

Moreira, P. A. S., Inman, R. A., & Cloninger, C. R. (2022). Humor and personality: Temperament and character have different roles. *Social Psychological and Personality Science, 13*, 1246–1258. https://doi.org/10.1177/19485506211066369

Ruch, W. F., & Heintz, S. (2014). Humour styles, personality and psychological well-being: What's humour got to do with it? *The European Journal of Humour Research, 1*, 1–24. https://doi.org/10.7592/EJHR2013.1.4.ruch

Ruch, W., & Heintz, S. (2017). Experimentally manipulating items informs on the (limited) construct and criterion validity of the Humor Styles Questionnaire. *Frontiers in Psychology*, *8*, 616. https://doi.org/10.3389/fpsyg.2017.00616

Ruch, W., & McGhee, P. E. (2014). Humor intervention programs. In A. C. Parks & S. M. Schueller (Eds.), *The Wiley Blackwell handbook of positive psychological interventions* (pp. 179–193). Wiley Blackwell.

Schermer, J. A., Rogoza, R., Kwiatkowska, M. M., Kowalski, C. M., Aquino, S., Ardi, R., Ardi, R., Bolló, H., Branković, M., Chegeni, R., Crusius, J., Doroszuk, M., Enea, V., Truong, T. K. H., Iliško, D., Jukić, T., Kozarević, E., Kruger, G., Kurtić, A., … Krammer, G. (2019). Humor styles across 28 countries. *Current Psychology*. https://doi.org/10.1007/s12144-019-00552-y

Vrticka, P., Black, J. M., & Reiss, A. L. (2013). The neural basis of humour processing. *Nature Reviews Neuroscience, 14*, 860–868. https://doi.org/10.1038/nrn3566

Zuckerman, M. (1991). *Psychobiology of personality*. Cambridge University Press.

Zuckerman, M. (2008). Rose is a rose is a rose: Content and construct validity. *Personality and Individual Differences, 45*, 110–112. https://doi.org/10.1016/j.paid.2008.02.014

Zuckerman, M., Kuhlman, D. M., Joireman, J., Teta, P., & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternative Five. *Journal of Personality and Social Psychology, 65*, 757–768. https://doi.org/10.1037/0022-3514.65.4.757